Ureteral Polyp Managed by Endoscopic Techniques

John Graff, BS,[1] Shyam Patnaik, BS,[1] Tal Cohen, MD,[1,2] Mark Memo, DO[1,2]
[1]Northeast Ohio Medical University, Rootstown, OH; [2]N.E.O. Urology Associates, Boardman, OH

Fibroepithelial polyps (FEPs) are rare benign tumors of mesodermal origin. They are found in the ureters 85% of the time, with the remainder located in the renal pelvis and occasionally the bladder. FEPs can present as flank pain, lower abdominal pain, and/or gross hematuria. Previous literature reports management of these benign lesions using open surgical techniques, laparoscopic techniques, and endoscopic management. In this article, the authors present their pure endoscopic management of a large ureteral polyp and a review of the current literature outlining the etiology, clinical presentations, and management techniques for FEP of the ureter.

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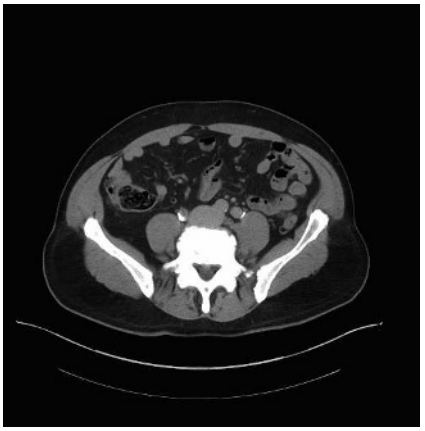
KEY WORDS

Ureteral polyp • Endoscopic management • Ureteral filling defect

A 70-year-old white man presented to the urologist for evaluation of microscopic hematuria discovered on routine urinalysis by his primary care physician. The patient endorsed weak urinary stream, nocturia, and urinary frequency; however, he denied any episodes of gross hematuria. The patient had a past medical history of benign prostatic hyperplasia, prostatitis, hypertension, and hypercholesterolemia. Family medical history was significant for prostate cancer present in the patient's brother. He denied use of cigarettes or smokeless tobacco, endorsed social alcohol use, and denied use of any other social drugs. On physical examination, the patient was noted to be uncircumcised with normal anatomy of the glans penis and shaft. The scrotum and testes were likewise noted to be of normal anatomy and free of any lesions. His prostate was estimated to be 50 g in size, symmetric, and had no nodules present.

On initial encounter, dipstick urinalysis revealed trace hematuria and leukocyte esterase. A urine cytology and CT scan of the abdomen and pelvis with IV contrast were ordered. Urine cytology revealed benign urothelial cells. The CT revealed a soft-tissue filling defect in the mid-right proximal ureter measuring approximately 3 cm in length (Figure 1). Other imaging findings of note included simple renal cysts and multiple prostatic calcifications.

Two months later, the patient was taken to the operating room for cystoscopy, bilateral retrograde



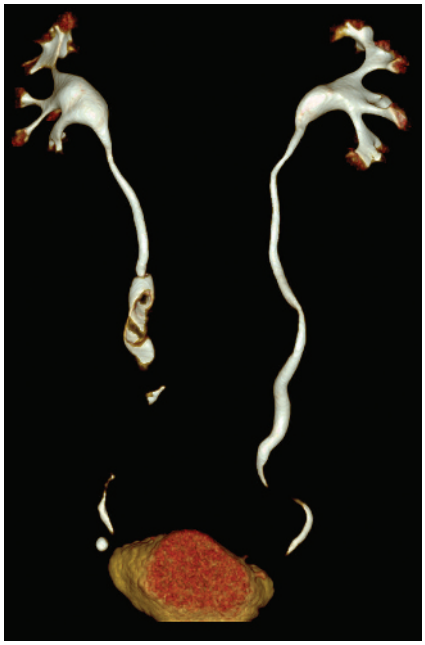


Figure 1. CT of abdomen and pelvis demonstrating filling defect (cross-section and three-dimensional reconstruction).

pyelograms, and ureteroscopy. Cystoscopy did not reveal any bladder lesions or abnormalities. Retrograde pyelograms initially performed on the left side did not reveal any filling defects or abnormalities. However, retrograde pyelogram performed on the right side corroborated CT findings of a 2- to 3-cm filling defect in the right ureter (Figure 2). Direct visualization of the right ureter via flexible ureteroscope revealed a soft, polypoid lesion upon a narrow stalk (Figure 3). The stalk was then laser ablated using a holmium laser and the mass freed. A ureteral stent was placed, and the mass left in place due to excessive resistance during removal (Figure 4).

The patient was taken back to the operating room a week later. During this procedure, a cystoscopy and ureteroscopy were once again performed. The freed polyp was once again visualized using a flexible ureteroscope and laser ablated. The polyp was reduced in size to approximately 5 mm and basket extracted. A stent was left after this procedure. Pathological analysis of the remaining tissue revealed benign, mostly acellular, hyalinized dense connective tissue. The tissue contained rare reactive urothelial cells and fibrosis with no evidence of amyloidosis (Figure 5).

The patient was seen on an outpatient basis a week following the second operation. The patient complained of dysuria and gross hematuria. Urine dipstick at this visit revealed moderate blood and 2+ protein. The patient was taken to the OR a third time a month later for cystoscopy, right retrograde pyelogram, and stent removal. Pyelogram demonstrated no filling defects and the stent was not replaced (Figure 6).

The patient was seen on an outpatient basis at both 3 and 10 months following the third operation. At these encounters, the patient denied any flank pain or dysuria. The patient also denied hematuria, and urine dipstick was negative for blood. Repeat CT of the abdomen and pelvis revealed no abnormalities.

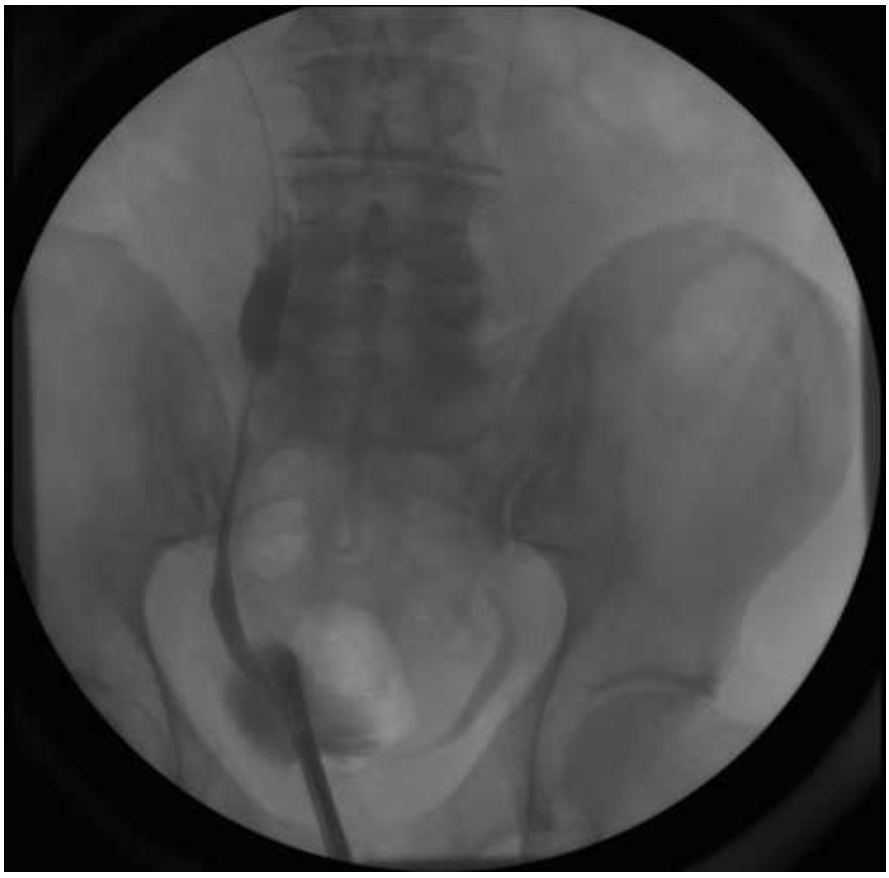


Figure 2. Fluoroscopy image demonstrating filling defect.

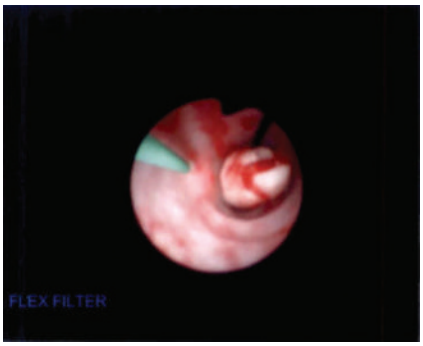


Figure 3. Fibroepithelial polyps upon ureteroscopic visualization.

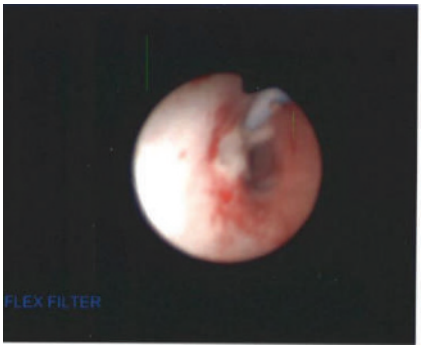


Figure 4. Base of polyp after laser ablation.

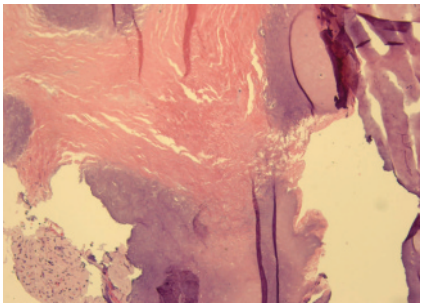


Figure 5. Pathological microscopic slide image.

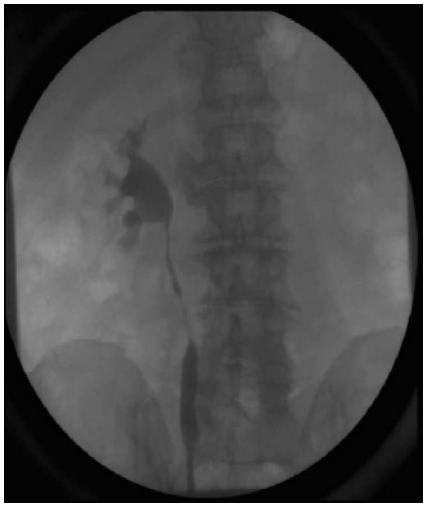


Figure 6. Retrograde pyelogram demonstrating resolution of previous filling defect.

Discussion

Fibroepithelial polyps (FEPs) are rare benign tumors of mesodermal origin. They are found in the ureters 85% of the time, with the remainder located in the renal pelvis and occasionally the bladder.[1,2] The most common location for these polyps is the proximal ureter, with 63% found in the ureteropelvic junction or upper ureter.[3] FEPs were found more often on the left side (60%) compared with the right.[2,3] The size of ureteral polyps has ranged from as small as 0.4 cm to 17 cm, with the median size being 4.0 cm.[4] The FEP presented in our case was 3 cm, which is similar to the average size presented in a study by Ludwig and colleagues.[4] A single polyp was present in 86.5% of cases.[4,5] Although most ureteral tumors are malignant, FEPs are the most common of the benign ureteral tumors.[5] However, FEPs can be confused with transitional cell carcinoma due to the predominance of malignant tumors in the ureters.[1]

The etiology of FEPs is unclear and thought to be multifactorial. Proposed causes include obstruction, trauma, chronic irritation from infection or stones, specific exogenous or endogenous carcinogens, or hormonal imbalances.[6-8] The most frequent presenting symptoms are flank or lower abdominal pain, and/or gross hematuria.[8] Other genitourinary symptoms such as increased urgency, frequency, or dysuria were less common.[3,8] FEPs are found more commonly in men than women (3:2) and have been discovered in all ages, from newborns to adults older than 70.[1] The age of diagnosis is mainly between the third and fifth decades.[1]

Initial imaging with intravenous pyelography and CT or retrograde urography can reveal a filling defect that leads to suspicion of a FEP.[9] However, the differential for filling defects in the ureter include transitional cell carcinoma, hematomas, or radiolucent calculi.[3] Additionally, because most ureteral tumors are malignant, relying on radiologic analysis alone can lead to more aggressive treatment for an otherwise non-malignant polyp.[1] Histological analysis is required to confirm FEPs. Ureteroscopy with laser coagulation to remove the

MAIN POINTS

- Fibroepithelial polyps (FEPs) are rare benign tumors of mesodermal origin. The etiology of FEPs is unclear and thought to be multifactorial. Proposed causes include obstruction, trauma, chronic irritation from infection or stones, specific exogenous or endogenous carcinogens, or hormonal imbalances.
- Histological analysis is required to confirm FEPs. Ureteroscopy with laser coagulation to remove the base of the polyp allows for identification and histologic diagnosis of FEPs.
- The literature reports multiple forms of management, including open surgical techniques, laparoscopic techniques, and endoscopic management with laser ablation. The latter treatment is becoming increasingly more common.

base of the polyp allows for identification and histologic diagnosis of FEPs.[10]

Various treatment options are available for FEPs, and include open surgical excision, robotic-assisted laparoscopic excision, and laser ablation and/or excision.[11] With the development and improvement of minimally invasive procedures, open surgery is being replaced with techniques such as endoscopic and laser treatment.[12] Percutaneous or ureteroscopic access with laser excision using the holmium:YAG (Ho:YAG) laser is being performed with good outcomes, especially for single or pedunculated FEPs.[11,12] Cases with FEPs that are large, multilobulated, or have a broad base have been shown to benefit from laparoscopic treatment.[12] Laparoscopic-assisted robotic surgery has been used for treatment of large or multifocal polyps primarily based in the ureter or in cases with polyps narrowing of the ureteropelvic junction.[12,13]

Recurrence of FEPs after resection is extremely rare. In one review of 108 cases from 1950 to 1980, there was no recurrence of any polyps after removal via open resection.[14] In a systematic review of patients with ureteral polyps between 1980 and 2014, only 1 patient out of the 57 patients available for follow-up was found to have a recurrent or residual growing polyp, which was attributed to incomplete resection.[4] Endoscopy with electrocautery or Ho:YAG laser excision was the most common method of polyp removal (43.4%), with the remaining polyps treated by ureterotomy, partial ureterectomy, or nephro-ureterectomy.[4]

Our patient presented with incidental microscopic hematuria that led to the discovery of a 3-cm fibroepithelial polyp in the right ureter. The use of pure endoscopic techniques with ureteroscopy and Ho:YAG laser in a staged fashion to ablate the polyp and basket extraction to successfully remove the FEP from the ureter was well tolerated. Our management of the ureteral FEP required a staged approach in order to safely treat the lesion and prevent complications. In the articles cited herein, there was a variety of endoscopic operative techniques applied. In one article detailing various cases, the FEP was addressed in a single percutaneous or ureteroscopic approach, always with stent placement after the initial resection procedure.[11]In another case report, a FEP was addressed in a single ureteroscopy approach, with indwelling stent placement after the procedure.[15] Upon revisiting our case after studying other articles, we understand that other providers were able to manage these lesions in a single operative technique. We may have been able to achieve this as well if we proceeded with laser ablation of the polyp at the time of the original procedure. Our attempt to extract the specimen at the original procedure after solely amputating the lesion at its stalk may have been too optimistic, especially in a native ureter. We may have been able to address the entirety of the lesion at the original operative setting by laser ablating the peak of the lesion, allowing us to make the FEP a more manageable size and then amputating the lesion at its easily visualized base. The reasoning for ablating the polyp while still attached to the stalk would allow us to have better visualization of the lesion during laser ablation because its position within the ureter would be stable.

Conclusions

FEP are rare benign ureteral tumors that can present with a variety of findings. Literature reports multiple forms of management, including open surgical techniques, laparoscopic techniques, and endoscopic management with laser ablation. The latter treatment is becoming increasingly more common in this clinical situation. In this article, we presented a case of a patient with a large ureteral polyp that was managed by pure endoscopic techniques in a staged fashion, with an excellent result and no complications or evidence of recurrence. ■

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